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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/700,809	11/20/2000	James W Jack	540-248	4254

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EXAMINER

COUSO, JOSE L

ART UNIT	PAPER NUMBER
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2621

DATE MAILED: 01/02/2004

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/700,809

Applicant(s)

JACK, JAMES W

Examiner

Jose L. Couso

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 6 . 6) ☐ Other: _____

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-9, 11-12 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Ward et al. (U.S. Patent No. 5,759,781).

With regard to claim 1, Ward describes an aperture for receiving radiation from object space (refer for example to column 24, lines 55-56); an interferometer arranged such that radiation received through the aperture is incident thereon (see for example figure 1 and refer for example to column 24, lines 50-62); an array of detector elements for receiving output radiation from the interferometer (refer for example to column 24, lines 63-66); a controller arranged to scan the interferometer through a range of different path lengths (see figure 1 and refer for example to column 24, lines 23-29); and a processor for receiving signals from a plurality of elements of the array, determining a spectral radiance for each of a plurality of pixels, each pixel corresponding to one or more elements of the array, and generating an image, the grey scale of which is determined by the spectral radiance of each pixel (see figure 1 and refer for example to column 24, lines 29-36).

As to claim 2, Ward describes wherein the array of detector elements is a two dimensional focal plane array (as clearly illustrated in figure 1).

In regard to claim 3, Ward describes wherein the processor performs a Fourier transform to obtain the spectral radiance of each pixel (refer for example to column 24, lines 34-36 and column 25, lines 30-32).

With regard to claim 4, Ward describes wherein the spectral radiance for a plurality of pixels is determined simultaneously (refer for example to column 23, lines 26-37).

As to claim 5, Ward describes further comprising an image generator for generating an image in which the grey scale is dependent on the spectral radiance of each pixel (refer for example to column 22, line 65 through column 23, lines 37).

In regard to claim 6, Ward describes wherein the interferometer is scanned a plurality of times to obtain the spectral radiance of the pixels (refer for example to column 24, lines 23-38).

With regard to claim 7, Ward describes wherein the interferometer scan is non uniform (refer for example to column 24, lines 24-29).

As to claim 8, Ward describes wherein the interferometer is a solid state device (refer for example to column 23, line 62 through column 24, line 9).

In regard to claim 9, Ward describes wherein the interferometer comprises a material the refractive index of which may be changed by controlling an electric field across it and wherein the path length of one leg of the interferometer is altered by varying the refractive index of the material (refer for example to column 24, lines 57-58).

As to claim 11, Ward describes wherein the processor performs an intra-array comparison and allocates each pixel a specific spectral content partly in dependence on

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the spectral radiance of other pixels (refer for example to column 22, line 65 through column 23, lines 37).

With regard to claim 12, Ward describes wherein the processor performs a histogram manipulation on the spectral radiance value and allocates a grey scale to each pixel in dependence of the number of pixels having a value in any one range to maximize grey scale content (refer for example to column 22, line 65 through column 23, lines 37). The software program carries out all the necessary histogram manipulation.

With regard to claim 14, Ward describes a camera for receiving radiation over the range of wavelengths of interest from the same object space as radiation received by the interferometer, the output of the camera providing intensity data which is combined by the processor with that received from the array of detector elements to obtain a score for each pixel (refer for example to column 24, line 63 through column 25, line 41).

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ward et al. (U.S. Patent No. 5,759,781) in view of Horton (U.S. Patent No. 5,777,736).

The arguments advanced in section 2 above, as to the applicability of Ward, are incorporated herein.

Although Ward provides a display (refer for example to column 23, lines 35-37), Ward does not specifically describe a display wherein the spectral radiance data is processed to provide on the display a pseudo three dimensional cube with two perpendicular axes corresponding to the coordinates of the image and the third mutually perpendicular axis corresponding to wavelength of radiation received, such techniques are well known and widely utilized in the prior art.

Horton discloses a high etendue imaging Fourier transform spectrometer system which provides for a display wherein the spectral radiance data is processed to provide on the display a pseudo three dimensional cube with two perpendicular axes corresponding to the coordinates of the image and the third mutually perpendicular axis corresponding to wavelength of radiation received (refer for example to column 10, lines 35-50 and column 15, line 39 through column 16, line 32).

Given the teachings of the two references and the same environment of operation, namely that of processing image signals using an interferometer, one of ordinary skill in the art at the time the invention was made would have been led in an obvious fashion to provide for a display wherein the spectral radiance data is processed to provide on the display a pseudo three dimensional cube with two perpendicular axes corresponding to the coordinates of the image and the third mutually perpendicular axis corresponding to wavelength of radiation received as taught by Horton in the Ward system since both systems are primarily concerned with processing image signals using an interferometer. This is an engineering design, providing for increased processing

details and greater efficiency, which fails to patentably distinguish over the prior art absent some novel and unexpected result.

5. Claims 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward et al. (U.S. Patent No. 5,759,781) in view of Fletcher et al. (U.S. Patent No. 3,977,787).

The arguments advanced in section 2 above, as to the applicability of Ward, are incorporated herein.

Although Ward does not specifically describe a polarimeter for receiving radiation from the same object space as radiation received by the interferometer, for the processor combining data received from the polarimeter with that received from the array of detector elements to obtain a score for each pixel, wherein the data from the different sources is combined by a fusion algorithm contained within the processor, such techniques are well known and widely utilized in the prior art.

Fletcher discloses a high-resolution Fourier interferometer-spectro-photopolarimeter which provides for receiving radiation from the same object space as radiation received by the interferometer, the processor combining data received from the polarimeter with that received from the array of detector elements to obtain a score for each pixel, wherein the data from the different sources is combined by a fusion algorithm contained within the processor (see figure 1, element 24 and refer for example to column 5, lines 41-44 and column 5, line 66 through column 6, line 16).

Given the teachings of the two references and the same environment of operation, namely that of processing image signals using an interferometer, one of ordinary skill in the art at the time the invention was made would have been led in an obvious fashion to provide for a polarimeter which provides for receiving radiation from the same object space as radiation received by the interferometer, the processor combining data received from the polarimeter with that received from the array of detector elements to obtain a score for each pixel, wherein the data from the different sources is combined by a fusion algorithm contained within the processor as taught by Fletcher in the Ward system since both systems are primarily concerned with the processing image signals using an interferometer. This is an engineering design, providing for increased processing efficiency as suggested by Fletcher (column 4, lines 14-25), which fails to patentably distinguish over the prior art absent some novel and unexpected result.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

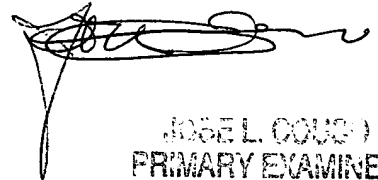
Auth, Markham et al., Tank et al., Csipkes et al., Cabib et al., McNamara et al., Garini et al., Theriault and Flanigan all disclose systems similar to applicant's claimed invention.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jose L. Couso whose telephone number is (703) 305-4774. The examiner can normally be reached on Monday through Friday from 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau, can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-8576.



JOSE L. COUSO
PRIMARY EXAMINER

Jlc
December 17, 2003